Students’ Beliefs and Attitudes about Mathematics - Survey

Compiled by Kelly McKie

The following categories are adapted from Schoenfeld (1989) and Stipek, Givvin, Salmon & MacGyvers (2001). Source of individual questions are cited after each question.

# Math as a set of operations versus a tool for thought

1. There is usually only one way to solve a math problem (Boaler/Perth)
2. The math that I learn in school is mostly facts and procedures that have to be memorized (Schoenfeld, 1989)
3. Mathematics involves mostly facts and procedures that have to be learned (Stipek et al., 2001)
4. In mathematics you can be creative and discover things on your own (Stipek et al., 2001)
5. In Mathematics, you can be creative and discover things by yourself (Zakaria & Musiran, 2010)

# Correct answers versus understanding as primary goal

1. Making mistakes in math helps me learn (Boaler/Perth)
2. In mathematics, answers are either right or wrong (Boaler/Perth)
3. It is important to talk about math to really understand it (Boaler/Perth)
4. When the teacher asks a question in math class:

You have to remember the right answer to answer it correctly

There are lots of possible right answers you might give

You have to think really hard to answer it

The students who understand only need a few seconds to answer correctly

(Schoenfeld, 1989)

1. How important is it to get the right answer in math? (Boaler/Perth)
2. Students who aren't getting the right answers need to practice on more problems (Stipek et al., 2001)
3. It doesn't matter whether students get the right answer as long as they understand the math concepts inherent in a problem. (Stipek et al., 2001)

# Enjoyment of math

1. When I struggle with a math question, I enjoy the challenge (Boaler/Perth)
2. I like math (Boaler/Perth)
3. Math is one of my favourite subjects (Boaler/Perth)
4. I don' t enjoy doing math (Stipek et al., 2001)

# Beliefs about the Nature of Mathematics:

1. Mathematics problems can be done correctly in only one way (Zakaria & Musiran, 2010)
2. Males are better at math than females (Zakaria & Musiran, 2010)
3. Some students have a natural talent for math and others do not (Zakaria & Musiran, 2010)
4. Mathematics is primarily a formal way of representing the real world (Zakaria & Musiran, 2010)
5. Some ethnic groups are better at math than others (Zakaria & Musiran, 2010)
6. In Mathematics something is either right or it is wrong (Zakaria & Musiran, 2010)
7. Some people are good at Mathematics and some are not (Zakaria & Musiran, 2010)
8. In general, people's math ability is something that can be changed with effort over time (Boaler/Perth)
9. There will always be some students who simply won't "get it" in math (Boaler/Perth)
10. Some people are born good at math, some people are not (Boaler/Perth)
11. People can't really change how intelligent they are in math (Boaler/Perth)

# Attributions of success or failure

1. When I get a good grade in math:

It's because I work hard.

It's because the teacher likes me.

It's just a matter of luck.

It's because I'm always good at math.

I never know how it happens.

1. When I get a bad grade in math:

It's because I don't study hard

It's because the teacher doesn't like me

It's just bad luck.

It's because I'm just not good at math.

It's because of careless mistakes.

(Questions 5 and 6 are Schoenfeld, 1989)

1. People can't really change how intelligent they are in math (Boaler/Perth)
2. Mathematical ability is something that remains relatively fixed throughout a person' s life (Stipek et al., 2001)
3. All students would be good at math if they worked hard at it (Stipek et al., 2001)

# Students’ views and perception of mathematics and school practices

1. Write 2 words that come to mind when you hear the word "Math". Separate your words with a comma (Boaler/Perth)
2. Some people are good at math and some just aren't (Schoenfeld, 1989)
3. I learn more about mathematics working on my own (Brookstein et al., 2011)
4. I feel confident in my abilities to solve mathematics problems. (Brookstein et al., 2011)
5. In the past, I have not enjoyed math class. (Brookstein et al., 2011)
6. When I see a math problem, I am nervous. (Brookstein et al., 2011)
7. The math that I learn in school is mostly thought provoking (Schoenfeld, 1989)
8. The math that I learn in school is mostly just a way of thinking about space, numbers, and problems (Schoenfeld, 1989)
9. How important is it to use models (e.g. pictures, cubes, rods) when learning math? (Boaler/Perth)
10. I like to go to the board or share my answers with peers in math class. (Brookstein et al., 2011)
11. I enjoy hearing the thoughts and ideas of my peers in math class. (Brookstein et al., 2011)
12. Mathematics interests me. (Brookstein et al., 2011)

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# References

**Brookstein, A., Hegedus, S., Dalton, S., Tapper, J., & Moniz, R. (2011). *Measuring Student Attitude in Mathematics Classrooms.* Kaput Center for Research and Innovation in STEM Education.University of Massachusetts Dartmouth**

**Stipek, D. J., Givvin, K. B., Salmon, J. M., & MacGyvers, V.L. (2001). Teachers' beliefs and practices related to mathematics instruction. Teaching and Teacher Education, 17, 213-226.**

**Zakaria, E. and Musiran, N. (2010) Beliefs about the Nature of Mathematics, Mathematics Teaching and Learning Among Trainee Teachers. *The Social Sciences*, 5(4), p. 346—351**

# UBC Mathematics Attitudes survey

http://www.math.ubc.ca/~cwsei/math110/math110-MAPSreport-2011-04.pdf

The following 39 questions are from a survey given to students (not sure which grades, possibly undergrads) and to experts (grad students and faculty at UBC, not sure which departments). Choices for answering ranged from strongly disagreed to strongly agreed.

1. An obstacle to learning math is having to memorize all the necessary information.
2. When I am solving a math problem, I try to predict what would be a reasonable answer.
3. It is useful for me to do lots and lots of problems when learning math
4. After I study a topic in math and feel that I understand it, I have difficulty solving problems on the same topic.
5. Knowledge in math consists of many disconnected topics.
6. When I solve a math problem, I find an example that looks like the problem given and follow the same steps.
7. I find that reading the text in detail is a helpful way for me to learn math.
8. There is usually only one correct approach to solving a math problem.
9. I'm satisfied if I can do the exercises for a math topic, even if I don't understand how everything works.
10. I cannot learn math if the teacher does not explain things well in class.
11. I do not expect math formulas to help my understanding of the ideas; they are just for doing calculations.
12. I study math to learn things that will be useful in my life outside of school
13. If I get stuck on a math problem on my first try, I usually try to figure out a different way that works.
14. Nearly everyone is capable of understanding math if they work at it.
15. Understanding math means being able to recall something you've read or been shown.
16. To understand math I talk about it with friends and other students.
17. If I am stuck on a math problem for more than five minutes, I give up or get help from someone else.
18. If I don't remember a particular formula needed to solve a problem on a math exam, there's nothing much I can do to come up with it.
19. In doing a math problem, if my calculation gives a result very different from what I'd expect, I'd trust the calculation rather than going back through the problem.
20. In math, it is important for me to make sense out of formulas and procedures before I can use them correctly.
21. I enjoy solving math problems.
22. Mathematical formulas express meaningful relationships among measurable things or amounts.
23. Learning math changes my ideas about how the world works.
24. To learn math, I only need to memorize solutions to sample problems.
25. Reasoning skills used to understand math can be helpful to me in my everyday life.
26. It is a waste of time to understand where math formulas come from.
27. I find carefully analyzing only a few problems in detail is a good way for me to learn math.
28. I can usually figure out a way to solve math problems.
29. School mathematics has little to do with what I experience in the real world.
30. There are times I solve a math problem more than one way to help my understanding.
31. Being good at math requires talent.
32. It is possible to explain mathematical ideas without using equations.
33. To understand math, I sometimes relate my personal experiences to the topic being studied.
34. When I am solving a math problem, if I can see a formula that applies I don't worry about the underlying concepts.
35. If I get stuck on a math problem, there is no chance that I will figure it out on my own.
36. When learning something new in math, I relate it to what I already know rather than just memorizing it the way it is presented.
37. I avoid solving math problems when possible.
38. To prepare for a math test, I only need to memorize solutions to examples.
39. I think it is unfair to expect me to solve a math problem that is not similar to any example given in class or the textbook, even if the topic has been covered in the course.